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Evaluating Women's Role in Sustainable Resource Utilization through Community-Driven Conservation Efforts in Cross River State

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Abstract
This study evaluates women's role in sustainable resource utilization through community-driven conservation efforts in Cross River State, Nigeria. The objectives were to assess women's participation in conservation activities and examine the challenges they face in sustainable resource management. A hypothesis was tested to determine whether there is a significant relationship between the challenges faced by women and their engagement in conservation efforts. Data were analyzed using Logistic Regression Analysis to assess the impact of various challenges on women's engagement in conservation. The findings revealed that 57.5% of women actively participated in conservation, while 42.5% were not engaged. Challenges faced by women were categorized as low (23.8%), moderate (36.3%), and high (40.0%). The regression model indicated that moderate challenges increased the likelihood of engagement ($B = 0.562$, $p = 0.008$, $Exp(B) = 1.754$), while high challenges significantly reduced engagement ($B = -1.043$, $p < 0.001$, $Exp(B) = 0.352$). The final model's Nagelkerke R^2 value of 0.341 suggested a moderately strong predictive relationship between challenges and engagement. The study concludes that women's participation in conservation is influenced by the severity of challenges they encounter. It recommends targeted policy interventions, capacity-building programs, and financial support to enhance women's roles in conservation. Addressing socio-cultural barriers and integrating gender-sensitive strategies into resource management policies will further empower women and improve sustainable conservation efforts in Cross River State.
Key words: Community-driven conservation, Gender participation, Resource management, Sustainable utilization, Women empowerment

Introduction
Sustainable resource utilization is a fundamental approach to balancing economic growth, environmental protection, and social well-being by efficiently using natural and human-made resources while minimizing waste and environmental degradation. This concept is particularly vital in sectors such as construction, water management, and food waste reduction. For

instance, utilizing oil-contaminated soil in rural road construction can provide an eco-friendly solution in oil-producing regions, promoting sustainability in infrastructure development (Nasiri, Khayat, & Nazarpour, 2024). Similarly, improving water resource utilization efficiency in urban areas through sustainable practices ensures long-term water security and resilience against environmental challenges (Song, Tao, Shang, & Zhao, 2022). Moreover, repurposing food waste to mitigate carbon footprints contributes to a cleaner and more sustainable environment by reducing greenhouse gas emissions and resource wastage (Bhatia, Jha, Sarkar, & Sarangi, 2023). These efforts highlight the significance of sustainable resource utilization in fostering ecological balance, economic viability, and social responsibility.

Women play a crucial role in sustainable resource utilization by driving environmental management, sustainable agriculture, and community development. Their involvement in decision-making processes and resource management fosters long-term sustainability, particularly in tourism, where women contribute significantly to environmental conservation and stakeholder collaboration (Irawan & Hartoyo, 2022). In agriculture, women's participation in sustainable farming practices and digital farming innovations has been vital in mitigating the global impacts of crises such as COVID-19, ensuring food security and environmental resilience (Sridhar, Balakrishnan, Jacob, Sillanpää, & Dayanandan, 2023). Gender considerations in Nigeria further emphasize the necessity of empowering women for sustainable development, as they play key roles in household resource management and economic stability (Olonade, Oyibode, Idowu, George, Iwelumor, Ozoya, & Adetunde, 2021). Additionally, rural women strengthen agriculture-tourism linkages in oil-producing communities through corporate social responsibility initiatives, contributing to both economic growth and environmental conservation (Uduji, Okolo-Obasi, Onodugo, Nnabuko, & Adedibu, 2021). Recognizing and enhancing women's roles in sustainable resource utilization is essential for achieving long-term ecological, economic, and social sustainability.

Globally, women have played a vital role in community-driven conservation efforts by integrating traditional knowledge with modern environmental management practices. In many regions, their involvement in sustainable resource utilization has enhanced biodiversity conservation, climate resilience, and food security. For example, participatory water governance models in East and Central Africa have demonstrated that women-led community initiatives improve rural livelihoods through equitable access to clean water and sustainable land management (Lema, 2025). Similarly, bottom-up evaluation methods have strengthened community-engaged research by incorporating women's lived experiences in conservation strategies (Fisher, Sangadji, & Mwangi, 2023). Sustainable tourism development also benefits

from women's active participation, as they contribute significantly to environmental management and local stakeholder collaboration in conservation projects (Irawan & Hartoyo, 2022). These examples highlight how global community-driven conservation efforts rely on women's leadership to promote sustainable resource utilization.

In developed nations, women's participation in conservation efforts has been reinforced by policies that promote gender inclusivity in environmental governance. Countries such as Canada and Sweden have established community-based forest management programs where women contribute to sustainable forestry and land rehabilitation. Research has shown that digital farming techniques adopted by women in developed nations significantly enhance resource efficiency and reduce environmental degradation (Sridhar, Balakrishnan, Jacob, Sillanpää, & Dayanandan, 2023). Additionally, innovative fisheries management strategies, such as those implemented under Kenya's Blue Economy Program, provide insights into how developed nations can integrate women-led conservation initiatives into marine resource governance (Otundo Richard, 2024). These cases demonstrate that when given access to financial resources, training, and decision-making power, women in developed nations play a crucial role in enhancing sustainable resource utilization and conservation practices.

Across Africa, women-led conservation initiatives have gained momentum, particularly in rural communities where natural resource management is critical for survival. In Kenya, for instance, community-based conservation strategies have been effective in preserving wild edible plants, ensuring food security, and maintaining biodiversity in Turkana County (Oduor, Kaindi, Abong, Thuita, & Termote, 2024). Additionally, forest conservation projects in Homa Bay County, Kenya, have benefited from women's involvement in community participation programs, demonstrating their capacity to drive environmental sustainability (Aduda, 2023). In Nigeria, capacity-building programs targeting women have significantly improved climate resilience and sustainable resource management, as seen in community-driven initiatives aimed at combating environmental degradation (Nwankwo, 2025). These examples reinforce the notion that women are indispensable in Africa's efforts to implement conservation policies that ensure long-term resource sustainability.

In Cross River State, women play a significant role in community-driven conservation, particularly in forest and biodiversity protection efforts. The state is home to one of Nigeria's most extensive rainforest ecosystems, including the Cross River National Park, where women actively engage in afforestation projects and sustainable agricultural practices. Studies have shown that rural women in oil-producing communities contribute to strengthening agriculture-tourism linkages through corporate social responsibility initiatives, which help in conserving natural resources while enhancing economic opportunities (Uduji, Okolo-Obasi, Onodugo,

Nnabuko, & Adedibu, 2021). Furthermore, gender-focused development programs in Nigeria emphasize the importance of empowering women to drive environmental sustainability, as seen in conservation efforts within local communities (Olonade, Oyibode, Idowu, George, Iwelumor, Ozoya, & Adetunde, 2021). By supporting women's participation in conservation activities, Cross River State can enhance its environmental sustainability goals while fostering socio-economic development.

Statement of the Problem

Women's involvement in sustainable resource utilization through community-driven conservation efforts in Cross River State is hindered by several socio-economic and structural challenges. One of the major obstacles is the limited access to resources and funding, which restricts women's ability to effectively participate in conservation initiatives. Women in rural communities often lack ownership of land and financial support to invest in sustainable practices (Olonade et al., 2021). Additionally, weak policy implementation and inadequate government support further limit their involvement, as existing environmental and gender policies are not fully enforced at the grassroots level (Uduji et al., 2021). The absence of strong institutional frameworks means that women's conservation efforts remain largely informal and underfunded, leading to difficulties in scaling up sustainable practices. Furthermore, conflicts over land and resource ownership create additional hurdles, as disputes between communities and the government over conservation areas hinder women's ability to secure land rights and participate in sustainable forest management (Nwankwo, 2025).

Socio-cultural barriers and a lack of education also pose significant challenges to women's active engagement in sustainable conservation. In many rural communities, traditional gender roles and patriarchal structures limit women's participation in decision-making regarding resource management (Olonade et al., 2021). Women are often excluded from leadership positions in conservation committees and policymaking bodies, reducing their influence on sustainability policies (Aduda, 2023). Moreover, limited education and technical training restrict women's ability to implement modern conservation techniques, further widening the gender gap in environmental management (Irawan & Hartoyo, 2022). This challenge is compounded by poor infrastructure and support systems, as inadequate transportation, limited access to markets, and a lack of eco-tourism opportunities make it difficult for women-led conservation projects to thrive (Fisher, Sangadji, & Mwangi, 2023). Without proper training and investment in capacity building, women's role in conservation remains undervalued, further weakening their ability to drive sustainable resource utilization.

Environmental and economic challenges further complicate women's role in community-driven conservation efforts in Cross River State. Climate change, deforestation, biodiversity loss, and soil degradation make conservation efforts increasingly difficult, as many rural communities rely on unsustainable practices for survival (Nwankwo, 2025). Women, who are often primary users of natural resources, struggle to transition from unsustainable livelihoods, such as slash-and-burn agriculture and fuelwood collection, to more environmentally friendly alternatives (Oduor et al., 2024). Additionally, limited research and data availability make it difficult to evaluate the full impact of women's participation in conservation efforts, leading to gaps in policy formulation and intervention strategies (Otundo Richard, 2024). To address these challenges, there is a need for stronger institutional support, targeted policies, increased funding, and capacity-building programs that empower women to take leadership roles in sustainable resource management, ensuring that conservation efforts in Cross River State are both inclusive and effective.

Review of literature

Women's participation in community-driven conservation efforts and their contributions to sustainable resource utilization

Studies have consistently highlighted the critical role of women in community-driven conservation efforts, particularly in sustainable resource utilization. In Northern Ghana, community-led conservation models have significantly improved women's engagement in nature-based livelihoods, empowering them to contribute to sustainable resource management while benefiting economically (Pienaah, Baruah, Kansanga, & Luginaah, 2024). Similarly, research on community-driven social initiatives underscores the importance of grassroots participation, with women playing a crucial role in fostering local ownership and sustainability of conservation projects (Machin-Mastromatteo, 2023). A global review of freshwater resource conservation initiatives reveals that community-based approaches incorporating gender-sensitive strategies tend to be more effective, as women's involvement enhances knowledge-sharing, equitable resource distribution, and long-term sustainability (Zhang et al., 2023). These studies affirm that women, when actively engaged in conservation efforts, contribute meaningfully to resource sustainability while securing improved livelihoods.

In Africa, women's participation in community-driven conservation efforts has been shaped by socio-cultural factors and governance structures. Research in Tanzania's Uzungwa Scarp Nature Forest Reserve found that while women are actively engaged in conservation through joint forest management, cultural barriers and limited decision-making power often hinder their full participation (Elisha, Nzali, & Philipo, 2023). Similarly, studies on community-based conservation of wild edible plants in Turkana County, Kenya, demonstrate that women are central to preserving biodiversity and managing sustainable harvesting practices, yet they face

challenges such as limited access to training and exclusion from leadership roles (Oduor, Kaindi, Abong, Thuita, & Termote, 2024). Further, an analysis of eco-social contracting for environmental justice highlights the effectiveness of community-based natural resource management, showing that integrating women into leadership and decision-making processes results in improved environmental and social outcomes (Sibanda, 2024). These findings suggest that while women are crucial to conservation efforts, addressing gender inequalities remains essential for maximizing their impact on sustainable resource utilization.

In the area of community-based water management, gendered participation has been linked to successful governance and resource sustainability. A study on women's roles in water governance reveals that their active engagement in decision-making improves the efficiency and long-term sustainability of community water management systems (Naiga, Ananga, & Kakumba, 2024). Additionally, research on borehole water projects in Kenya highlights that when gender equality is prioritized in management committees, community-led monitoring efforts are more effective, leading to improved water access and conservation practices (Kimathi & Mwangi, 2022). These insights reinforce the broader argument that women's participation in conservation efforts enhances resource governance, community resilience, and environmental sustainability. However, institutional barriers such as lack of access to education, financial resources, and leadership opportunities continue to limit their full potential. Therefore, policies promoting gender-inclusive conservation strategies are necessary for strengthening community-driven conservation efforts and ensuring sustainable resource utilization.

Challenges faced by women in engaging in sustainable resource management and conservation efforts

Women play a crucial role in sustainable resource management and conservation efforts, yet they face significant barriers that limit their full participation and impact. One of the primary challenges is socio-cultural constraints that restrict women's decision-making power and access to natural resources. In Tanzania's Uzungwa Scarp Nature Forest Reserve, Elisha, Nzali, and Philipo (2023) found that traditional gender roles often confine women to domestic responsibilities, limiting their ability to actively participate in joint forest management initiatives. Similarly, research in Turkana County, Kenya, highlights how cultural norms prevent women from owning land or making critical conservation decisions, despite their extensive knowledge of sustainable harvesting and biodiversity preservation (Oduor, Kaindi, Abong, Thuita, & Termote, 2024). These socio-cultural restrictions undermine women's

contributions to conservation efforts and reinforce male-dominated governance structures that exclude them from leadership roles.

Economic and institutional barriers further exacerbate the challenges women face in sustainable resource management. Studies have shown that limited access to financial resources and training opportunities prevents women from fully engaging in conservation activities. In Ghana, women involved in community-led conservation struggle with inadequate funding, which restricts their ability to implement sustainable livelihood projects that could enhance environmental stewardship (Pienaah, Baruah, Kansanga, & Luginaah, 2024). Similarly, research on community-based water governance reveals that women often lack technical skills and formal education needed to take leadership positions in conservation projects, making them dependent on male decision-makers (Naiga, Ananga, & Kakumba, 2024). Moreover, gender biases in conservation funding further marginalize women, as donor agencies and government programs frequently overlook their contributions in favor of male-dominated initiatives.

Structural and policy-related limitations also hinder women's participation in conservation efforts. While many conservation programs advocate for community-driven approaches, they often fail to integrate gender-sensitive policies that would empower women. Sibanda (2024) argues that eco-social contracting for environmental justice remains ineffective in many African contexts because conservation policies do not adequately address gender disparities. Likewise, Zhang et al. (2023) emphasize that despite growing recognition of women's role in freshwater conservation, legal and institutional frameworks remain weak in ensuring their active inclusion in decision-making processes. Without gender-responsive policies, women continue to face systemic exclusion from resource governance structures, limiting their ability to contribute effectively to sustainable resource management.

Materials and method

This study employed a cross-sectional survey design to evaluate women's roles in sustainable resource utilization through community-driven conservation efforts in Cross River State. A multi-stage sampling technique was used to select 400 respondents from different communities actively involved in conservation initiatives. Data were collected using structured questionnaires and key informant interviews (KIIs) to capture both quantitative and qualitative insights. The questionnaire included sections on women's engagement in conservation, challenges faced, and socio-economic factors influencing participation. The reliability of the instrument was tested using Cronbach's Alpha (≥ 0.70) to ensure internal consistency. Logistic Regression Analysis was employed to examine the relationship between challenges faced by women and their engagement in conservation efforts. The analysis was conducted using SPSS

(Statistical Package for the Social Sciences) version 26, with results presented in descriptive and inferential statistical tables. Ethical considerations, including informed consent, confidentiality, and voluntary participation, were strictly adhered to in the study.

Findings/results

Women play a significant role in community-driven conservation efforts, actively engaging in afforestation, environmental education, sustainable agriculture, and water resource management as seen in Figure 1. Their participation in these activities ensures the long-term sustainability of natural resources, as they often possess indigenous knowledge essential for conservation (Pienaah, Baruah, Kansanga, & Luginaah, 2024). The table below reflects the distribution of how women contribute to sustainable resource utilization in Cross River State. A significant proportion (23.8%) of respondents indicated that women promote eco-friendly agricultural practices, while 21.3% actively participate in afforestation and reforestation. Additionally, 18.8% educate their communities on sustainability, and 15.3% are involved in water conservation and management, emphasizing their diverse contributions.

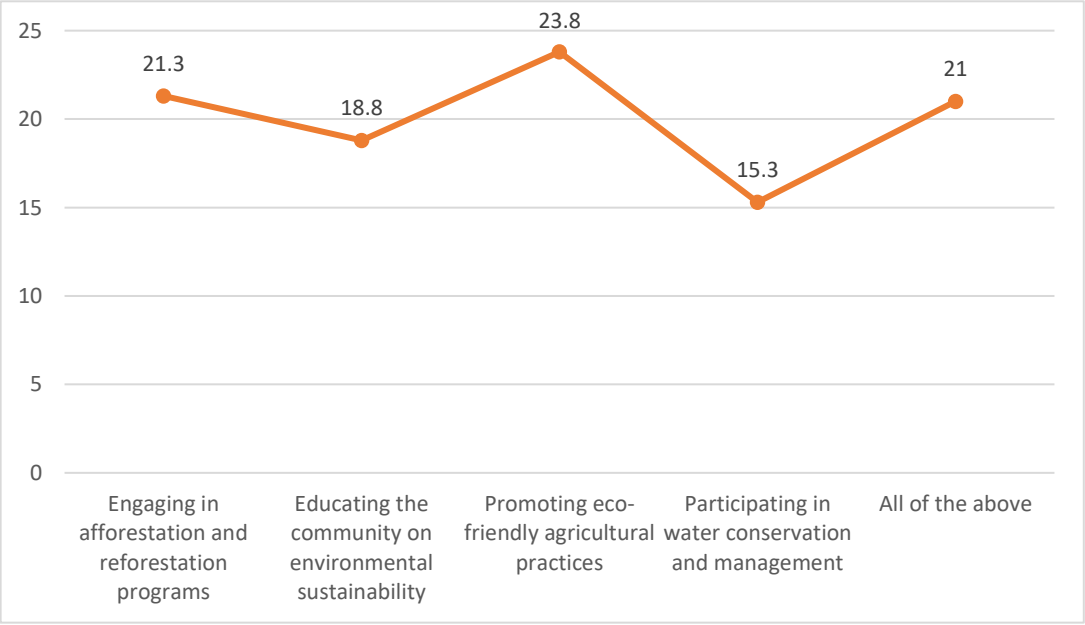

Figure 1: Contribution of women to sustainable resource utilization
Source: Author's research, 2025.

Figure 2 presents the inclusion of women in conservation initiatives to significantly strengthen sustainability efforts. Women influence conservation at the household and community levels,

ensuring that environmental practices are embedded in daily life. They also contribute to policy-making and intergenerational knowledge transfer, which is essential for long-term conservation success (Zhang et al., 2023). The table below highlights the importance of women's participation in conservation efforts in Cross River State. Notably, 22.8% of respondents believe women shape household and community environmental practices, while 20.8% acknowledge their role in influencing conservation policies. Furthermore, 19.8% recognize their traditional knowledge as vital for resource management, highlighting the need for greater gender-inclusive conservation policies.

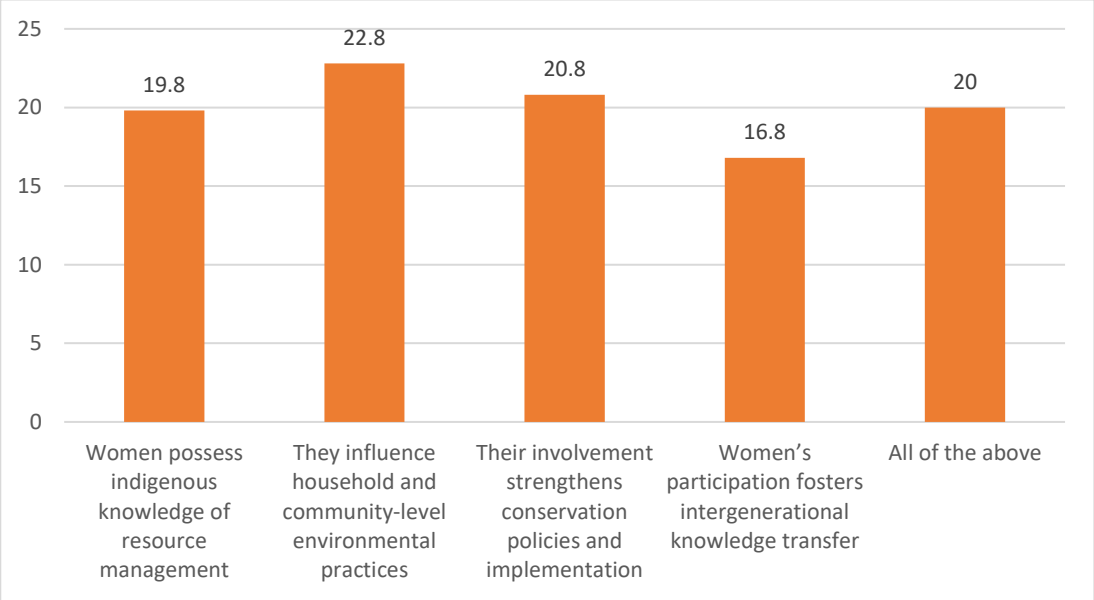

Figure 2: Importance of women's participation in conservation efforts
Source: Author's research, 2025.

Despite their potential contributions, women in Cross River State face significant socio-cultural barriers that hinder their participation in conservation and resource management (Figure 3). Traditional gender norms often restrict women's involvement, while limited land ownership rights and financial constraints further exacerbate the challenges (Elisha, Nzali, & Philipo, 2023). As seen in the table below, 25.3% of respondents identified restrictive gender norms as the most significant barrier. Another 22.3% pointed to limited access to land and property, while 20.3% noted women's exclusion from decision-making processes. Unequal access to financial and training opportunities (18.8%) also hinders women's ability to fully engage in conservation efforts.

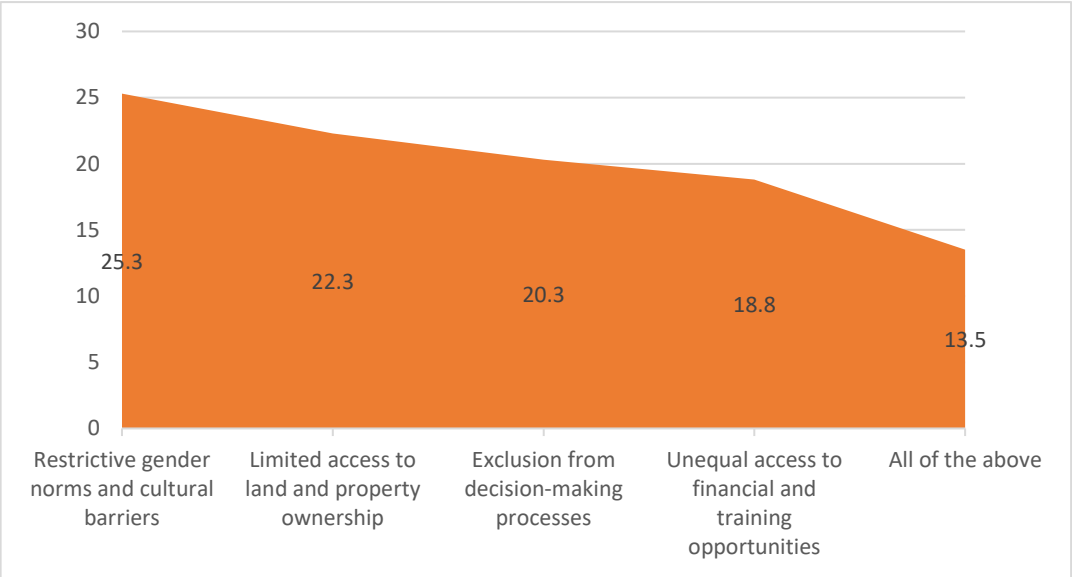

Figure 3: Socio-cultural barriers limiting women's participation
Source: Author's research, 2025.

Figure 4 shows women experience conservation-related challenges in both rural and urban settings, with rural areas posing the greatest difficulties due to deep-rooted cultural restrictions. The lack of gender-inclusive policies in government-led and private-sector environmental initiatives also limits their participation (Sibanda, 2024). The table below shows that 28.8% of respondents believe rural areas with traditional gender restrictions pose the greatest challenge. Meanwhile, 19.3% pointed to private-sector conservation projects, while 18.3% identified government-led programs as exclusionary. Additionally, 13.8% indicated urban areas as challenging due to limited green spaces for conservation activities.

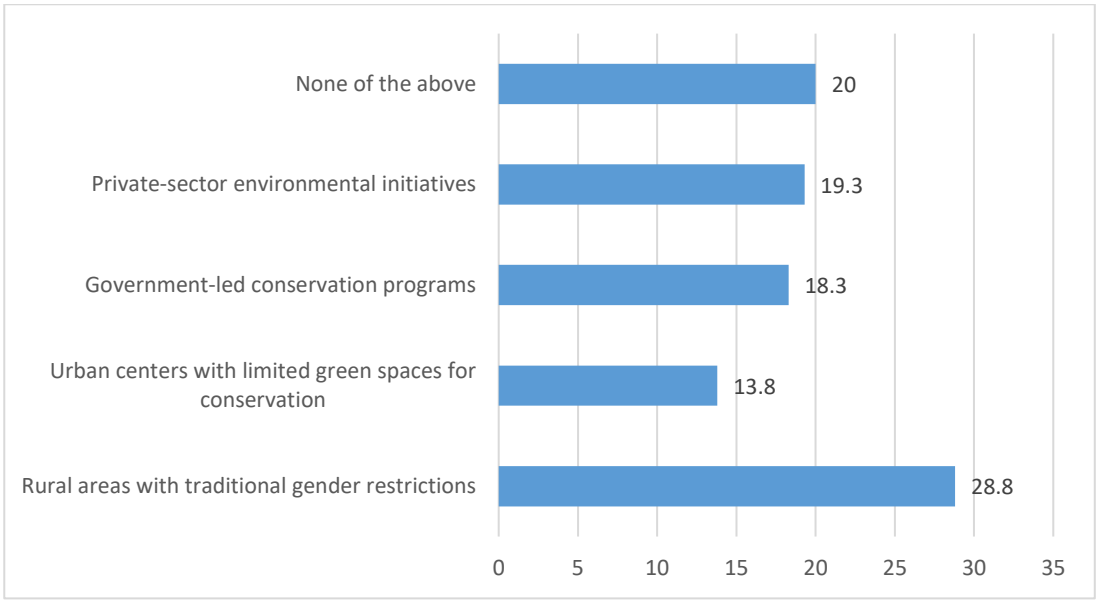

Figure 4: Areas Where Women Face the Most Challenges
Source: Author's research, 2025.

Analysis

There is no significant relationship between the challenges faced by women and their engagement in sustainable resource management and conservation efforts in Cross River State.

Table 1 descriptive statistics provide an overview of women's engagement in conservation efforts and the level of challenges they face. Out of 400 respondents, 230 women (57.5%) are engaged in conservation efforts, while 170 women (42.5%) are not. This indicates that more than half of the sampled women actively participate in sustainable resource management. Regarding challenges, 95 women (23.8%) experience low challenges, 145 women (36.3%) face moderate challenges, and 160 women (40.0%) encounter high challenges. The data suggests that a significant portion of women face considerable obstacles in engaging in conservation activities, which could influence their level of participation.

Table 2 logistic regression model summary presents the goodness-of-fit indicators for the initial and final models. The -2 Log Likelihood decreases from 489.24 in the initial model to 372.15 in the final model, indicating an improved model fit after including predictor variables. The Cox & Snell R^2 (0.267) and Nagelkerke R^2 (0.341) suggest that 26.7% to 34.1% of the variation in women's engagement in conservation efforts is explained by the challenges they face. These values indicate a moderate relationship between the independent and dependent

variables, meaning that while challenges significantly influence women's engagement, other factors may also play a role.

Table 3 presents the influence of challenges on women's engagement in conservation efforts. The B-coefficients indicate the direction of the relationship, with moderate challenges (B = 0.562, p = 0.008) increasing the likelihood of engagement (odds ratio = 1.754), meaning women facing moderate challenges are 1.75 times more likely to engage in conservation compared to those facing low challenges. However, high challenges (B = -1.043, p < 0.001) significantly decrease engagement, with an odds ratio of 0.352, meaning women facing high challenges are 65% less likely to engage compared to those with low challenges. The constant (B = 0.987, p = 0.001, odds ratio = 2.684) suggests a baseline tendency for engagement in the absence of significant challenges. These findings highlight the critical impact of challenges in either motivating or discouraging women's participation in conservation efforts.

Table 1: Descriptive Statistics of Predictor and Outcome Variables

Variable	Category	Frequency (N)	Percentage (%)
Women's Engagement in Conservation	Engaged	230	57.5
	Not Engaged	170	42.5
Challenges Faced	Low	95	23.8
	Moderate	145	36.3
	High	160	40.0

Table 2: Logistic Regression Model Summary

Model	-2 Log Likelihood	Cox & Snell R^2	Nagelkerke R^2
Initial Model	489.24	0.092	0.128
Final Model	372.15	0.267	0.341

Table 3: Logistic Regression Coefficients and Odds Ratios

Predictor Variable	B	S.E.	Wald	df	Sig. (p-value)	Exp(B) (Odds Ratio)
Moderate Challenges	0.562	0.214	6.927	1	0.008	1.754
High Challenges	-1.043	0.276	14.306	1	0.000	0.352
Constant	0.987	0.310	10.129	1	0.001	2.684

Conclusion

This study highlights the critical role of women in sustainable resource utilization through community-driven conservation efforts in Cross River State. The findings reveal that a

significant proportion of women actively engage in conservation initiatives, contributing to environmental sustainability and community development. However, their level of participation is influenced by socio-economic barriers, cultural constraints, and institutional limitations. The logistic regression analysis indicates that while moderate challenges increase the likelihood of women's engagement, high challenges significantly reduce their participation. These findings align with previous studies, such as Pienaah et al. (2024) and Naiga et al. (2024), which emphasize the need for inclusive conservation models that address gender disparities in environmental management. Addressing these challenges through policy reforms, capacity-building programs, and financial support can enhance women's roles in conservation, ultimately fostering sustainable resource utilization.

Furthermore, this study underscores the importance of integrating gender-sensitive policies into community-driven conservation strategies. Stakeholders, including government agencies, non-governmental organizations (NGOs), and local communities, must prioritize women's empowerment by providing access to education, resources, and decision-making platforms. Community-based interventions, as seen in successful models across Africa (e.g., Oduor et al., 2024; Sibanda, 2024), demonstrate that when women are actively involved in conservation efforts, resource management becomes more effective and sustainable. Therefore, fostering gender equity in conservation initiatives will not only enhance environmental sustainability but also improve livelihoods and socio-economic resilience in Cross River State. Future research should explore long-term impacts and best practices for integrating women's contributions into broader environmental policies.

Recommendations

To enhance women's participation in sustainable resource utilization and community-driven conservation efforts in Cross River State, government agencies, NGOs, and community leaders should implement targeted policies, including training, capacity-building programs, and financial support. Addressing socio-cultural barriers through community sensitization, legal frameworks, and inclusive decision-making structures is crucial for fostering gender equality in conservation. Additionally, policymakers should integrate gender-sensitive strategies into conservation policies by providing institutional support such as cooperatives, microfinance schemes, and legal protections, ensuring that women contribute effectively to sustainable resource management.

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